

# **US Patent Application**

TITLE

**A LIGHTER**

INVENTOR

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**CONFIDENTIAL**

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## **A Lighter**

### **Field of the Invention**

The present invention relates to a lighter, and in particular, to a lighter with an upper cover.

### **Background of the Invention**

Currently, lighters with upper covers on market have their upper covers connected to brackets of combustion devices, which disadvantageously make the structures complicated and the connections between the upper covers and the brackets vulnerable to abrasion. Besides, it is relatively difficult to manufacture and assemble the lighter with such structure, which may lead to high rate of unqualified products, and furthermore, if there is any failure in the connection, it would be much difficult to fix it. In addition to such lighters, there is another type of lighter which has its upper cover integrated with the lighter housing. Disadvantages of such structure are that the structure is complicated, the proportion of unqualified products is high due to the application of point-welding process to the connection, and the overall aesthetic effect of the lighter is damaged by possible concave welding spots caused by high temperature welding.

### **Summary of the Invention**

One objective of the present invention is to provide a lighter with an upper cover to overcome the above defects of the prior art and have simple structure, easy process of assembly and low cost.

In accordance with the present invention, the lighter comprises a lighter housing, a gas container for storing liquid inflammable gas, a combustion device

connected to said gas container, and an igniter for igniting inflammable gas in said combustion device, characterized in that said housing includes an upper cover and a case, wherein one side of said upper cover includes a protuberance forming a small hole thereon; a connector disposed below said protuberance of said upper cover for connecting said upper cover and said case, wherein said connector includes a recess portion coupling with said protuberance and having transverse holes on both sides of the recess portion; and a bolt for rotationally connecting said protuberance and the recess portion; wherein said case has at its edge port a longitudinal groove being connected to said connector and having an opening at the edge port of the groove to couple with the protuberance of said upper cover. Furthermore, the connector has a thickness from 1.0 mm to 11 mm.

The lighter with an upper cover according to the present invention is simple in structure and easy in assembly. Since there is provided with a connector, the variation to the structure of the upper cover and the case of the lighter may achieve simple and rational assembly of the case with low cost and simple manufacture.

### **Brief Description of the Drawings**

Figure 1 is a structural sectional view of the present invention.

Figure 2 is a structural sketch of the upper cover, connector and case according to the present invention.

Figure 3 is a drawing showing enlarged sectional structure of the connector of the present invention.

Figure 4 is a drawing showing enlarged sectional structure of the case of the present invention.

Wherein: 1 - lighter housing; 11 - upper cover; 110 - protuberance; 111 - small hole; 12 - case; 121- longitudinal groove; 122 - opening; 2 - gas container; 3 - combustion device; 4 - igniter; 5 - connector ; 51 - transverse hole; 52 - recess

portion; 6 - bolt.

### **Detailed Description of the Invention**

The present invention now will be described in detail with reference to the embodiments and drawings.

Refer to Figure 1, a lighter comprises a lighter housing 1, a gas container 21 for containing liquid inflammable fuel gas, a combustion device 3 connecting to said container 2, and an igniter 4 for igniting inflammable gas in said combustion device 3, wherein said housing 1 includes an upper cover 11 and a case 12. At one side of said upper cover 11 there is a protuberance 110 having a small hole 111 thereon (Refer to Fig. 2).

Refer to Figs. 2 and 3, there is a connector 5 between said upper cover 11 and said case 12 in the lighter housing. The connector 5 is disposed below the protuberance 110 of the upper cover 11 to connect the upper cover 11 and case 12. The connector 5 includes a recess portion 52 coupling with the protuberance 110 of the upper cover 11 and having transverse holes 51 on both sides of the recess portion 52. A bolt 6 is provided to rotationally connect the protuberance 110 and recess portion 52.

Refer to Fig. 4, there is a longitudinal groove 121 at the edge port of the case 12. The connector 5 is fitted in with and connected to the longitudinal groove 121. The longitudinal groove 121 has at its edge port an opening 122 fitting the protuberance 110 of the upper cover 11 therein.

During the process of assembly, the protuberance 110 is inserted into the recess portion 52, and the bolt 6 passes through the transverse holes 51 and the small hole 111 to connect the connector 5 and the protuberance 110. At the edge of the case 12, there are two longitudinal grooves 121 corresponding to both sides of the connectors 5 (refer to Fig. 4). In this way, the connectors 5 may easily inserted into the longitudinal grooves 121, or further fixed with glue, so as to form

a simple integrated lighter housing. In this structure, the upper cover 11 is connected directly to and integrated with the case 12 to eliminate the problem of fitting the upper cover 11 tightly against a core without welding or screw connection and fixation, and thus making the lighter appear a good aesthetic and glossy without any flaw.

The connector has a thickness from 1.0 mm to 11 mm, which facilitate to couple the connector 5 with the upper cover 11 and case 12.

In order to open or close the upper cover 11 of the housing 1 without hitch, an opening 122 is formed at the edge port of the longitudinal groove 121 of the case 12 so as to moveably connect the protuberance 110 and case 12 when the upper cover 11 fits in the case 12.

Though the present invention has been described in details with reference to the drawings and embodiment, it should be understood by those skilled in the art that the aforementioned embodiments are only for description of the invention and not intended to limit to the present invention. A various of modifications or variations could be made according to the invention and will fall into the protective scope of the present invention.